

Chapter 26

Sleep Disorders

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Introduction

Complaints of poor sleep or insomnia are among the most common reasons why patients consult their primary care physician. The diagnosis of insomnia, however, is non-specific and easily confused with parasomnias and hypersomnias. So the clinician must fully assess the sleep problem and rule out a primary or underlying condition (Taylor et al., 2007) before treating sleeplessness symptomatically with a hypnotic (medication to induce sleep). The three cases in this chapter illustrate insomnia as well as less common sleep disorders.

At the end of this chapter, the reader will be able to

1. Discuss a differential diagnosis for symptoms of insomnia
2. Identify the behaviors associated with parasomnias
3. Develop a plan for assessment of daytime hypersomnia

Case Vignette 26.1.1 Presenting Situation: Maria Thompson

Maria Thompson is a 36-year-old married woman who is the mother of two pre-teen boys. She comes to your primary care office with the complaint of “not sleeping.” Until a few years ago, she never noticed any sleeping problems although she describes herself as a light sleeper at all times. Now, her insomnia causes her to toss and turn for at least 2 hours. She grows increasingly worried about not getting enough sleep, before she finally drops off. During the night, she wakes up for no reason at all, or because of a trivial noise or minimal urge to use the bathroom. Then she cannot go back to sleep as she thinks about the difficult problems in her home.



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Insomnia

Epidemiology: Insomnia, defined as any combination of symptoms, including difficulty falling asleep, frequent waking, and early morning awakening is one of the most common complaints among primary care patients. It is estimated to affect 60 million Americans each year, affecting about 40 % of women and 30 % of men. The prevalence of insomnia increases with age.

Differential Diagnosis: The clinical examination and history are the most critical elements directing the clinician toward a differential diagnosis. Difficulty sleeping (insomnia/dyssomnia) should be distinguished from excessive sleepiness (hypersomnia). Physical, psychological, and other underlying causes should also be considered and ruled out. The type of insomnia (e.g., difficulty falling asleep as opposed to early morning wakening) can be determined by specific, clarifying questions. Alcohol or sedative use, smoking, and mood disorders can cause insomnia and inquiries about them are part of a careful history. Possible underlying medical problems such as endocrine disorders can be identified on physical examination and targeted laboratory tests. A sleep study is the ideal way to objectively measure the quality of a patient's sleep and monitor for physiologic events disturbing sleep, discussed further in the cases below.

Case Vignette 26.1.2 Continued

Mrs. Thompson has already tried to adjust her sleep time, at the suggestion of a magazine article, and goes to bed at least an hour after her husband. When she wakes up and has a hard time going back to sleep, she often finishes out the night on the living room couch so as not to disturb her husband. She is awake early in the morning, but feels exhausted and worn out. "Often it's hard to get up and started on the day." Coffee helps, but by noon, she is ready "to crawl back into bed," if only she felt she actually could get back to sleep. The patient believes that her two boys have begun to worry about her. Her husband is at times solicitous about her health and at other times irritated with her perceived "laziness." He wonders "if we'll ever have sex again."

A few months ago another physician checked Mrs. Thompson's thyroid status (which was normal), and prescribed sleeping pills. First, she tried hydroxyzine, then zolpidem. Later, she tried a low dose of trazodone. Mrs. Thompson says that all these medications "made me even more tired" but none helped her sleep through the night.



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At this point, Mrs. Thompson's case should raise some eyebrows because she is not responding to prescribed sleep medications. She seems to distinguish her problem not as being lack of tiredness, but that of not falling asleep, as if something else is keeping her aroused. Consider the history and further questioning below:

Case Vignette 26.1.3 Continued

History: Mrs. Thompson says that she has always been in good health. The two childbirths were the only times she was in the hospital. After the second baby, she had "the blues" for a while, but got over it after a few weeks. She denies any family history of psychiatric illness. Her mother, who died of cervical cancer at age 41, had also been having sleeping problems, but Mrs. Thompson thinks this was related to the cancer.

Mrs. Thompson does not drink alcohol and has never used illicit drugs. She takes no medications. She appeared somewhat tense at the beginning of the interview, and when asked about her feeling "at a dead end" she suddenly bursts into tears. She is worried about her failures as a wife and mother. She has been withdrawing from activities she could and should be spending with her family. Mrs. Thompson used to enjoy running a book-club with neighborhood friends, but, after her second son was born, gave up on that, at first because she was too busy taking care of the baby, later because she did not feel like doing it.

Mental Status Examination: Mrs. Thompson is alert and fully oriented. Her affect is dejected, tearful, and weary, but she responds to your supportive comments and maintains stable eye contact. She describes her mood as "worried." There is no evidence of cognitive impairment, thought disorder, or perceptual disorder. She denies feeling suicidal.



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Mrs. Thompson's tearful affect, sense of failure, and anhedonia (lack of pleasure), suggest that the original complaint of insomnia is likely a symptom of a major depressive episode. As with other common, general symptoms such as fatigue and weight loss, insomnia should not be reduced to a purely symptom-based diagnostic label. The original treatments geared toward sleep were ineffective because they did not address the primary cause of Mrs. Thompson's insomnia.

Case Vignette 26.1.4 Conclusion

After further questioning, you discover that Mrs. Thompson meets criteria of Major Depressive Disorder with five out of nine criteria in the DSM-IV-TR lasting longer than 2 months. After discussion of several treatment options, she agrees to a trial with an antidepressant and a limited supply of a benzodiazepine. In addition, she appreciates that the latter medicine may only have a limited role in her improvement and that psychological interventions, family therapy, and supportive counseling regarding stress management and coping could be most important for her recovery. She agrees to schedule an appointment with a local therapist covered on her insurance plan. You see Mrs. Thompson weekly for a month, and then schedule a 3-month follow-up appointment. She reports improvement in mood, sleep, and energy and has started to see the therapist.

Treatment: Treatment of insomnia targets underlying primary pathology whenever it is present. For example, successful treatment of a depressive disorder will improve related sleep problems. In primary insomnia or when coexisting diagnoses have only an aggravating effect, the clinical target is the insomnia (Morgenthaler et al., 2006). First-line interventions include sleep hygiene and the practice of relaxation techniques (see chapter 4). Sleep medications can assist these interventions and build a positive reward experience. Hypnotic medications exert their effects in one of three neurotransmitter systems: The histamine receptors such as diphenhydramine and hydroxyzine (most over-the-counter sleep aids), the GABA receptors (benzodiazepines and “Z-drugs”), or the melatonin receptors (ramelteon). In short-term situations where insomnia results from a time-limited stress exposure (e.g., during a hospital stay), pharmacologic intervention can be justified as the first choice of treatment (Morin et al., 2007). Long-term use of sleep medications remains controversial because of the potential for abuse and dependence with most hypnotics (Taylor et al., 2006). Ramelteon and eszopiclone, a Z-drug, have been shown to maintain long-term effectiveness for insomnia with minimal risk of dependence.

Case Vignette 26.2.1 Vickie Sippets

Vickie is a 17-year-old high-school student seen in clinic with her parents. Her mother explains she and her husband are worried about their daughter who started sleepwalking about 6 weeks earlier. At first Vickie’s parents thought she was waking up to use the bathroom, and was so groggy she would not respond. When it happened nearly every night they led her back to her room and woke her up. Several minutes into the interview, Vickie speaks for the first time, and tells you she was quite puzzled and could not explain how she ended up out of bed.



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Parasomnias

Epidemiology: Parasomnias are less common than insomnias and mostly affect children and young adults. Somnambulism (sleep walking disorder) is by far the most prevalent parasomnia with an estimated prevalence of 5–15 % among children in the United States.

Differential: Vickie's presentation suggests somnambulism (Lee-Chiong, 2005). Somnambulism is a primary sleep disorder that may require treatment. Other possibilities need to be considered, and the differential diagnosis includes a seizure disorder with psychomotor phenomena (partial complex seizures), and a factitious disorder (Eisensehr and Schmidt, 2005). In a factitious disorder, the patient assumes a sick role in order to obtain gratification of certain psychological needs of which he or she is not consciously aware (see chapter 29).

Case Vignette 26.2.2 Continued

History: Vickie and her mother report that there is no past history of any psychiatric problems. Her performance in school is above average, and she enjoys sports. She broke up with a boyfriend about a year earlier and has not been dating since. She denies any use of drugs or alcohol. She has not been sexually active and has taken a voluntary vow to remain celibate until married. Vickie hopes to study psychology in college.

You ask Vickie's parents to step out for a moment, and then ask Vickie further questions about her personal life. She continues to endorse her same convictions and history that she is confused about what is going on, and that she has not taken any alcohol or drugs.

Mental Status Examination: Vickie is a young woman in no acute distress. She appears age-appropriate in her development and intellectual function. There is no evidence of psychosis or cognitive impairment.



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Diagnosis: The key to diagnosis in sleep disorders is an electrophysiological evaluation known as a polysomnograph, or sleep study (Szelenberger et al., 2005). During the assessment, an electroencephalogram (EEG) records wave patterns from non-REM sleep (stages 1–4), and REM (rapid eye movement) (Table 26.1). Concurrently, muscle activity, respiratory rate, heart rate, and pulse oximetry are measured during periods of sleep and wakefulness. A sleep study with polysomnographic EEG data should show, in the case of somnambulism, an onset of motor phenomena coinciding with deep non-REM sleep (stages 3 and 4, also called delta sleep) earlier in

Table 26.1 Sleep stages

Sleep stage	EEG findings	Clinical findings
Stage I	Low voltage, fast waves	Light sleep, easily aroused
Stage II	Sleep spindles and K complexes	Easily awakened; metabolism slows
Stages III and IV	Slow delta waves	Deep sleep, no muscle movement, difficult to awaken. Sleep stage for sleep walking, enuresis, and night terrors
Rapid eye movement (REM)	Highly active, with small and irregular waves similar to waking state	Four to five distinct periods in 90 minutes cycles during night of sleep, increased in the last one-third of the night; dreams occur

the night, with REM sleep toward morning (Guilleminault et al., 2006). In order to diagnose a partial complex seizure disorder (also called temporal lobe epilepsy or psychomotor seizure disorder), a sleep-deprived EEG uses nasopharyngeal leads to detect abnormal electrical activity in deep brain structures. When a patient had an abnormal EEG, neurologists will further evaluate for the cause of the abnormal activity and will treat the patient with antiseizure medications. If a sleep EEG study does not offer a clear diagnosis, psychological testing may be useful to determine if personality factors would make the patient more likely to communicate her distress by developing physical symptoms.

Case Vignette 26.2.3 Conclusion

Vickie's sleep studies support a working diagnosis of somnambulism. When Vickie and her parents return, you explain to them that sleepwalking is a fairly common occurrence in children and young adults, and usually resolves spontaneously. Because she is not awake during motor activities there is a possibility that Vickie could harm herself. It is therefore important to make her environment safer, e.g., by blocking staircases and locking away knives. You further explain that the incidence of somnambulism may increase with anxiety, stress, and unresolved conflicts, such as her break-up with the boyfriend. Her parents accept this with some hesitancy, but agree after further reassurance that they can return if the problem worsens or does not go away.

Treatment: With somnambulism, the first intervention is educational. Occasionally, a clinician will reduce the frequency of somnambulism by temporarily prescribing a benzodiazepine or other tranquilizers which would be considered if Vickie's problem worsened or did not go away.

Case Vignette 26.3.1 Randolph Jegriff

Mr. Randolph Jegriff, an obese, 30-year-old recently married man comes to your primary care clinic at his wife's suggestion. He reports that during their recent honeymoon his wife noticed that "the little naps I take" occur frequently and without any warning: "She'd be driving the car, and talking to me, and suddenly, I was gone." His wife told him that he "looked funny" when he fell asleep "like I had collapsed." Sometimes, he would briefly just "slump down like he'd been hit on the head" and she wondered if he'd gone asleep again, except he seemed to be alert, and straightened up again after a few seconds.



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Hypersomnias

Differential and Epidemiology: The facts in the case above suggest a hypersomnia, and specifically the possibility of narcolepsy with cataplexy (abrupt loss of muscle tone) (Dauvilliers et al., 2007). Other possibilities include sleep apnea, a petit mal seizure disorder, as well as a problem adjusting flexibly to alternating sleep–wake times [sometimes called "shift worker syndrome" (Ohayon et al., 2002)].

Narcolepsy has prevalence rates of less than 10 %, and is rarer than parasomnias or insomnias (Longstreth et al., 2007). Untreated, it has the potential for serious functional impairment but has an excellent prognosis with treatment response. Sleep apnea is another relatively common hypersomnia. It is estimated to be as prevalent as 9–24 % in men aged 30–60, 4–9 % for women of the same age (Rowley, 2006). Sleep apnea may lead to a host of related symptoms, including cognitive and mood problems. A rare cause of hypersomnia is Kleine–Levin syndrome. This is a primary hypersomnia affecting adolescents with sleep attacks that can last for 2 days, with periods of irritability, hyper-sexuality, and confusion.

Case Vignette 26.3.2 Continued

History: Mr. Jegriff works as a post-doctoral student at the near-by college. He denies any medical problems. He admits to an occasional glass of wine, but no recreational drugs since his late teenage years when he had occasionally smoked marijuana. He characterizes himself as a light sleeper who needs "lots of naps during the day." Mr. Jegriff remembers a few embarrassing occasions when he briefly fell asleep while teaching classes. At those times, he considered such episodes "a wake-up call" to try and get more sleep during the night. With further questioning

Mr. Jegriff and his wife concur that he does not have trouble snoring at night, waking up to catch his breath, or periods of simply not breathing for several seconds.

Physical/Mental status examination: 30-year-old obese male with a 15-inch neck circumference, oral pharyngeal cavity appears clear and unobstructed. No other abnormal findings.



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Diagnosis: The key to differential diagnostic understanding with narcolepsy is a sleep study with polysomnographic EEG data. This examination will provide data regarding latency of sleep onset which is reduced in narcolepsy to 5 minutes or less from a normal average of 20 minutes. Sleep EEGs may also show brief intrusions of REM sleep during “twilight” periods. This abnormal REM activity is responsible for the sleep paralysis and hypnagogic (falling asleep) and hypnopompic (waking up) hallucinations associated with narcolepsy. The decreased latency of sleep onset in narcolepsy is accompanied by electromyographic findings suggestive of cataplexy. The EEG would also be helpful in the diagnosis of sleep apnea as well as a petit mal seizure disorder. With Mr. Jegriff, a larger neck circumference, crowded pharynx, and history of snoring would support the diagnosis of obstructive sleep apnea. A history of periodic respiratory cessation, followed by waking or other catching of breath, would support investigation of a much less common central sleep apnea.

Case Vignette 26.3.3 Conclusion

Mr. Jegriff is scheduled for a sleep study which comes back strongly suggestive of narcolepsy. His treatment begins conservatively with a well-designed sleep hygiene schedule. Mr. Jegriff needs to go to bed at approximately the same time every night, avoid sleep-delaying activities or stimulants, sleep in the same room, get up at about the same time, etc. You explain that this will reduce the frequency of sleep attacks and minimize functional impairment due to narcolepsy, and that this is why his symptoms worsened with the vacation. In addition, he is prescribed modafinil (Provigil®) to increase his daytime alertness, especially after he demonstrates desire to regain the confidence to drive.

Treatment: Once diagnosed, patients must start taking precautions to avoid complications. For instance, a person with untreated narcolepsy should not drive. The condition itself is otherwise benign, and, with treatment, there are usually no limitations on patient functioning. The vulnerability must be kept in mind; however, when a patient with a history of narcolepsy undertakes intercontinental travel or starts variable shift work, patient, family, and physician ought to prepare for a possible relapse.

Narcolepsy appears to be the result of deficient hypocretin production in the brain. In the research laboratory, CSF levels of the neurotransmitter hypocretin

are low or non-existent in narcolepsy (Seigel and Boehmer, 2006). Modafinil is a compound that seems to stimulate hypocretin secretion (Seigel and Boehmer, 2006). Traditionally, stimulants such as methylphenidate have been used as well. In addition, tricyclic antidepressants can reduce the incidence of cataplexy. Sodium oxybate (the same compound as the club drug GHB) is a medication that reduces the number of cataplexy attacks in patients with narcolepsy.

Sleep apnea often improves with weight loss, although many patients require positive pressure oxygen during the night to maintain normal blood oxygenation levels. Some patients have surgery known as uvulopalatopharyngoplasty (UPPP) on their soft palates to remove soft tissue and improve nighttime airflow (Rowley, 2006).

Table 26.2 Dysomnias

	Diagnostic features	Special features
Dysomnias		
Primary insomnia	One month or more of poor sleep	Rule out substances, mood disorders, pain, environmental causes
Primary hypersomnia	One month or more of excessive sleep	Rule out substances, endocrine, mood, and causes
Hypersomnias		
Narcolepsy	Cataplexy, hallucinations, sleep paralysis, and sleep attacks	Sleep study
Obstructive sleep apnea	Interruptions of breathing during the night, periods of low blood oxygenation	Excessive soft tissue in oropharynx. Desaturation of blood triggers brief awakenings for breathing
Central sleep apnea	Interruptions of breathing during the night, periods of low blood oxygenation	Dysfunction of thalamus due to neurological disorder
Circadian rhythm sleep disorder	Mismatch of sleep – wake cycle and environment	Includes shift work, jet lag,
Nocturnal myoclonus	Jerking movements of legs while sleeping	May have symptoms during the day as well
Restless leg syndrome	Uncomfortable leg sensations that interfere with sleep	
Kleine–Levin Syndrome	Periodic hypersomnia with episodic increases in appetite and sexual activity	Affects mainly adolescent males

Table 26.3 Parasomnias

Parasomnias	Diagnostic features	Special features
Sleepwalking	Repeated episodes of walking during sleep, difficult to wake	Amnesia for episode
Sleep terror	Awakenings related to intense fear state	Patient not alert, no recall of a dream, awakens with a scream, usually early in sleep cycle
Nightmare disorder	Awakenings related to vivid nightmares	Patient is alert upon awakening

Table 26.4 Related sleep diagnoses

Nocturnal bruxism	Teeth clenching and grinding during the night	May require mouth guard to protect teeth
Nocturnal enuresis	Bed wetting after age 6	Primary: no history of nocturnal bladder control Secondary: previous bladder control
Sleep hyperhidrosis	Night sweats	May be related to menopause, some serious illnesses

Review Questions

1. The most common form of insomnia is
 - (a) Insomnia due to major depressive disorder
 - (b) Insomnia due to hyperthyroidism
 - (c) Restless leg syndrome
 - (d) Primary insomnia
 - (e) Shift worker syndrome
2. In the differential diagnosis of somnambulism, factitious disorder can be detected
 - (a) By psychological evaluation
 - (b) By a specific EEG pattern
 - (c) By polygraph test
 - (d) By waking up the patient
 - (e) By examination of the CSF
3. In the treatment of narcolepsy, the most important element is
 - (a) Modafinil in the morning
 - (b) Cognitive behavioral therapy
 - (c) Sleep hygiene
 - (d) Aversive conditioning
 - (e) Methylphenidate
4. In the diagnostic assessment of persons with insomnia, which factor is not usually of importance?
 - (a) Total sleeping time
 - (b) Daytime sleepiness
 - (c) Sleep onset latency
 - (d) Coexisting psychiatric problems
 - (e) Socioeconomic class

Answers

1. d, 2. a, 3. c, 4. e

Appendix Populated Table

Table 26.5 Maria Thompson

What are the facts?	What are your hypotheses?	What do you want to know next?	What specific information would you like to get?
36-year-old woman, married, mother of two pre-teens	Overwhelmed with perceived family obligations? Stress can lead to abnormalities in cortisol regulation/PHA feedback	What does “overwhelmed” mean? When did she notice that having two kids was more demanding?	Which times in child-raising present with particular demands on parents?
Complaint of insomnia	Primary versus secondary insomnia?	Any lifestyle facets to explain poor sleep?	Has a sleep study been done to objectify the complaints?
Light sleeper at all times	Predisposition for sleep disorder?	Were there any periods when she did NOT have sleep problems?	To determine which sleep stage is affected?
Tosses and turns for at least 2 hours	Increased sleep latency due to situational factors?	Any subjective factors preventing her from going to sleep?	
Throughout the night she wakes up	Interrupted sleep as a symptom of MDD	Are there any other signs and symptoms of a mood disorder?	Would a dexamethasone suppression test be useful?
Cannot go back to sleep	Early morning wakening as a symptom of MDD	Any PMH suggestive of endocrine abnormalities, manic or hypomanic episodes, substance abuse?	Is psychological testing going to help in order to determine deficits in self-confidence?
Worried	Concerns about problems and adequacy could point toward a mood disorder		
Troubling problems she has not been able to resolve		Lab: TFTs, LFTs	

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